

Commonwealth of Kentucky
Division for Air Quality
PERMIT STATEMENT OF BASIS

(DRAFT)

Title V, Construction / Operating
Permit: V-08-015
Kentucky West Virginia Gas Company
Dwale, KY 41621
April 25, 2008
Durga Patil, Reviewer

SOURCE ID:	21-071-00138
AGENCY INTEREST:	44058
ACTIVITY:	APE20080002

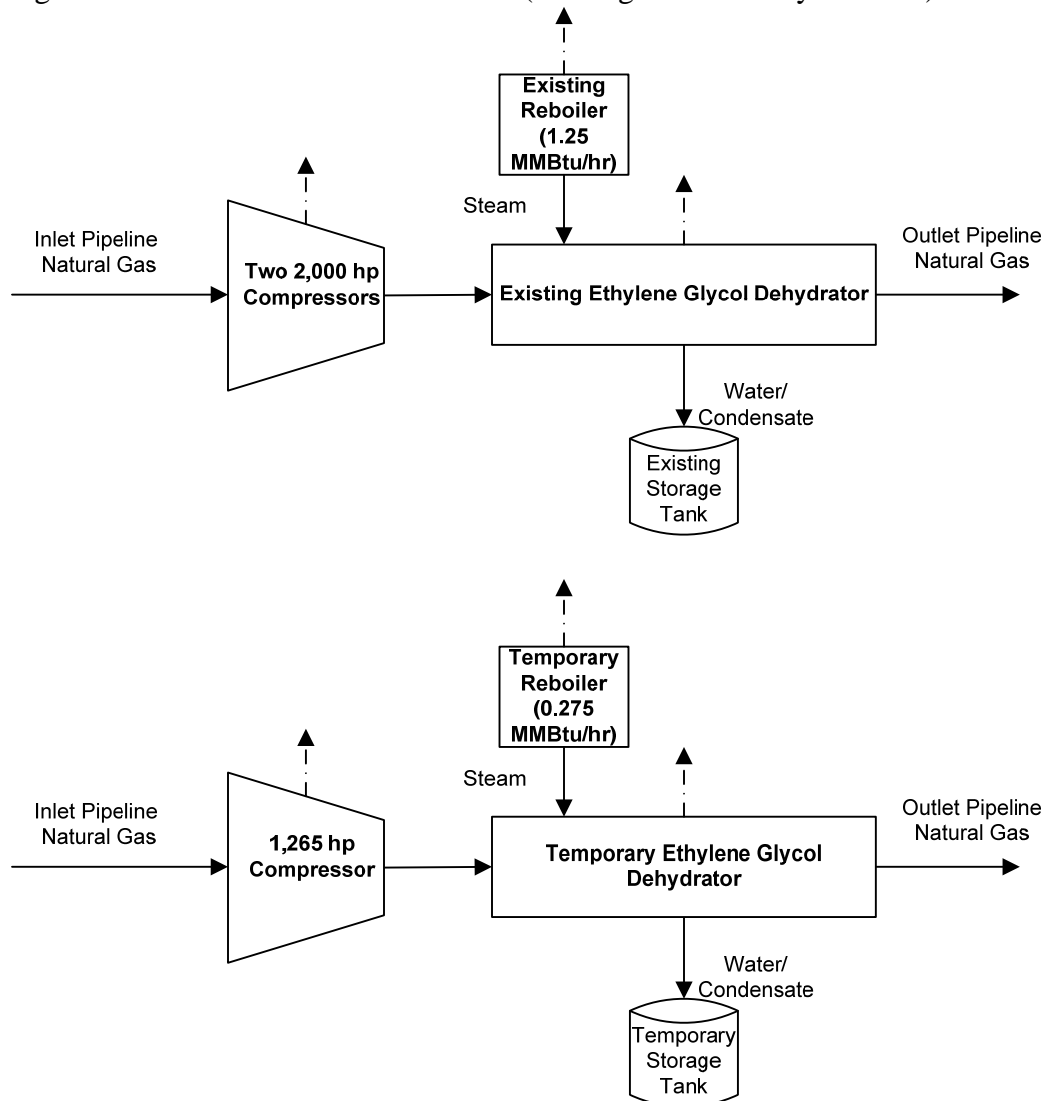
SOURCE DESCRIPTION:

On April 21, 2008, the permittee applied to the Division for the construction/operation of new temporary units for a limited time, at the existing natural gas compression station in Dwale, Kentucky (Dwale Station). The proposed modification will consist of construction and operation of one temporary natural gas-fired compressor of capacity 1,265 brake horsepower (bhp), one temporary triethylene glycol (TEG) dehydration unit operating at a maximum of 10 million standard cubic feet per day; with an associated reboiler of capacity 0.275 million British thermal units per hour (mmBtu/hr), and one 4,200 gallon condensate storage tank. The permittee will not operate these units longer than 945 hours and shall keep records of operating hours for the temporary units. Currently, the Dwale Station consists of the following emission units:

- Two natural gas-fired Cooper-Bessemer compressor engines, each installed in 1968 and having a maximum power output capacity of 2,000 horsepower (hp);
- One TulPro dehydration unit, installed in 1994 and having a maximum natural gas flowrate of 26 mmscfd. The emissions from this unit are controlled by a flare;
- One natural gas-fired reboiler, having a maximum heat input capacity of 1.25 mmBtu/hr;
- Tank #1, storing pipeline condensate and having a maximum capacity of 8,820 gallons;
- Tanks #2 and #3, storing used oil and having a maximum capacity of 1,000 and 1,025 gallons, respectively;
- Tank #4, storing compressed lube oil and having a maximum capacity of 2,000 gallons;
- Tank #5, storing triethylene glycol and having a maximum capacity of 1,550 gallons;
- Tank #6, storing diesel and having a maximum capacity of 100 gallons;
- Tanks #7 and #8, storing antifreeze and having a maximum capacity of 1,000 and 1,100 gallons, respectively; and
- One natural gas-fired emergency generator, having a maximum power output capacity of 80 hp.

With the proposed project, no modifications will be made to the existing process or emission units. The existing Dwale Station compresses natural gas as it is being shipped via pipeline. Natural gas enters the station via a distribution pipeline system and is first compressed using two (2) natural gas-fired compressors, identified as Units #1 and #2. The compressed natural gas stream is then processed through the existing TEG dehydration unit. The dehydration unit filters the natural gas and separates excess water using a distillation process in which heat is provided to the dehydration unit column by a natural gas-fired reboiler, which is rated at 1.25 mMBtu/hr. The natural gas stream from the dehydration unit is then reintroduced into the pipeline to be transported further along the distribution system. Liquid fractions removed from the natural gas via dehydration are stored in small storage tanks at the station. A process flow diagram, showing the relationship between each of the emission units described above, is included in Figure 1.

Figure 1. Dwale Station Process Flows (existing and temporary addition)



The Kentucky Hydrocarbons natural gas processing plant in Langley, KY will be shutdown on a temporary basis for maintenance purposes in June 2008. Therefore, natural gas flow to the Langley facility will have to be diverted to other facilities to maintain compression capacity on the Big Sandy pipeline in Eastern Kentucky during that timeframe, which is the premise for the proposed project at the Dwale Station.

The Dwale Station is currently operating under Title V General Permit No. G-04-001 (Revision 1), issued on May 27, 2005. Since the Dwale Station will be subject to specific operating and emission limitations, a separate Title V permit is being issued for this facility.

Source Classification

Natural gas compressor stations are not on the list of 28 Prevention of Significant Deterioration (PSD) source categories defined at 401 KAR 51:001, Section 1 (120)(a)(1)(b) for which the major source threshold is 100 tpy. Floyd County is classified as an attainment area for all criteria pollutants. The potential emissions of nitrogen oxides (NO_x) at the existing station, unconstrained, are greater than 250 tpy. Therefore, the facility is currently classified as a major PSD source. The increase in potential emissions of each criteria pollutant, including volatile organic compounds (VOC) and NO_x, from the proposed modification will be less than PSD significant emission rate increase thresholds over the course of the proposed temporary operating period. To ensure that the increase in VOC and NO_x emissions from the proposed modification will be less than 40 tpy each, the operation of the temporary units and proposed modification shall be restricted to less than 945 hours per year. Thus, the proposed construction will be classified as a minor modification under the PSD program and will not be subject to PSD requirements.

In addition, the Dwale Station controls VOC and hazardous air pollutant (HAP) emissions from the existing dehydration unit using a flare. The source-wide controlled emissions of HAPs are less than 10 tons per year (tpy) of an individual HAP and 25 tpy of total HAPs. The HAP emissions will continue to be less than major source thresholds after the proposed modification. HAP emission limits of 9 tpy of an individual HAP and 22.5 tpy of total HAPs are also included in the permit.

Type of Control and Efficiency:

The Dwale Station has one flare that controls emissions from the existing TulPro dehydration unit. The design efficiency of the flare is at least 98% and it operates in compliance with the applicable provisions specified in 401 KAR 63:015, Flares. The flare will not be modified as part of the proposed temporary modification at the Dwale Station.

Emissions Documentation:

Emission factors for the compression engines were mainly obtained from AP-42 and those supplied by the manufacturer.

Potential emissions from the reboilers are calculated using U.S. EPA's AP-42 factors for natural gas combustion equipment.

Potential VOC and HAP emissions from the temporary dehydration units are estimated using GRI-GLYCalc Version 4.0.

VOC and HAP emissions for the permanent dehydration units are obtained from GRI-GLYCalc Version 4.0.

In addition to VOC and HAP emissions from the dehydration units, a negligible amount of emissions will result from the on-site storage tanks that are classified as insignificant activities.

Applicable Regulations:

The permittee is subject to:

40 CFR 63 Subpart HH, National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities as incorporated by reference in 401 KAR 63:002. Based on the fact that the existing dehydration unit does not operate without a flare, the benzene emissions are less than 0.99 tpy. The temporary dehydration unit operates without a flare but its benzene emissions are less than 0.99 tpy based on its operating limitation. Hence the two dehydration units are exempt from the requirements in 40 CFR 63 subpart HH, except for the recordkeeping requirements for benzene emissions. The permittee shall determine and keep records of average benzene emissions from the dehydrator units pursuant to 40 CFR 63.772(b)(2) and 63.774(d)(1)(ii).

40 CFR 63 Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines as incorporated by reference in 401 KAR 63:002.

This Subpart is applicable to stationary reciprocating internal combustion engines (RICE) located at major and area source of HAPs. Pursuant to 40 CFR 63.6590(a)(2)(iii), the regulation applies to the new unit U05 since it will be installed after June 12, 2006. However, pursuant to 40 CFR 63.6665, the new RICE located at an area source does not need to comply with any of the requirements of the general provisions. There are no applicable requirements for the MACT for the area sources. Also, pursuant to 40 CFR 63.6590(b)(3), existing four stroke lean burn stationary RICE and existing emergency stationary RICE do not have to meet the requirements of NESHAP Subparts ZZZZ and A. Moreover, no initial notification is necessary for these existing units. Therefore, existing Cooper-Bessemer engines and the emergency generator will not be subject this rule.

401 KAR 59:015, New Indirect Heat Exchangers

This applies to the existing reboiler as its heat capacity is greater than the rule applicability threshold of 1 mmBtu/hr. The allowable particulate matter (PM) emissions will not exceed 0.56 lb/mmBtu. The visible emissions from the existing reboiler shall not have opacity greater than 20%. The allowable sulfur dioxide (SO₂) emissions will not exceed 3.0 lb/mmBtu. Compliance with the PM and SO₂ emission limits is demonstrated based on the emission factors in lb/mmBtu being less than the allowable for burning natural gas. Compliance with the opacity emission limit will be demonstrated by the reboiler burning only natural gas.

401 KAR 63:015, Flares.

Since the flare at the Dwale Station was constructed after the rule applicability date of April 9, 1972, the permittee shall be subject to the provisions of this rule. Pursuant to 401 KAR 63:015 Section 3, the opacity of visible emissions from the flare stack will not exceed 20% for more than 3 minutes in any one day. Since only inlet and residue natural gas vapors will be combusted in the flare, the permittee will be in compliance with the opacity emissions standard at all times.

401 KAR 63:020, Potentially Hazardous Matter or Toxic Substances.

Since 401 KAR 63:020 is a general prohibitory rule and applies to practically all facilities, this rule will apply to the Dwale Station. The permittee shall demonstrate compliance with this rule by only combusting natural gas in the existing and new combustion sources. The permittee shall also perform a screening modeling using U.S. EPA approved methodology and submit results to the Division within three (3) months of issuance of the public notice for the draft permit V-08-015 to evaluate the impact of toxic air pollutants (formaldehyde).

Regulations Not Applicable:

40 CFR 64, Compliance Assurance Monitoring. The existing compressors will each have potential pre-control device emissions of NO_x greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source. Similarly, the existing TulPro dehydration unit will have potential pre-control device emissions of VOC greater than 100 tpy. However, the existing compressors and dehydration unit are not subject to an emission limitation for NO_x and VOC, respectively. Therefore, pursuant to 40 CFR 64.2(a), these units will not be subject to the CAM rule.

401 KAR 51:017, Prevention of Significant Deterioration of Air Quality. The Dwale Station is located in Floyd County, which is classified as in attainment for all criteria pollutants. The source category containing natural gas compressor stations is not on the list of 28 PSD source categories defined at 401 KAR 51:001, Section 1 (120)(a)(1)(b) for which the major source threshold is 100 tpy. Thus, the major source threshold for regulated pollutants under the PSD program for the facility is 250 tpy. The potential emissions of NO_x at the existing facility, unconstrained, are greater than 250 tpy. Thus, the facility is classified as a major source

under the PSD program. However, since natural gas compression is not one of the 28 listed source categories and since there are no applicable New Source Performance Standards that were in effect on or before August 7, 1980, the fugitive volatile organic compound (VOC) emissions are not counted toward determination of PSD applicability. Based on the proposed

operating limit of 945 hours for the temporary units, the increase in potential non-fugitive emissions from the proposed modification will be less than respective significant emission rate increase thresholds. The potential non-fugitive emissions of PM/PM₁₀, VOC, CO, and NO_x will be 0.001, 39.02, 0.22, and 2.65 tpy, respectively. Therefore, this permit action is not subject to PSD requirements.

40 CFR 63 Subpart HHH – Natural Gas Transmission and Storage Facilities. Pursuant to 40 CFR 63.1270, NESHAP Subpart HHH applies to natural gas transmission and storage facilities that are major sources of HAP as defined in 40 CFR 63.2. The Dwale Station will continue to be a minor source of HAPs; therefore, the requirements of this subpart will not apply to the station.

40 CFR 60 Subpart IIII – NSPS for Stationary Compression Ignition Internal Combustion Engines. Pursuant to 40 CFR 60.4200, NSPS Subpart IIII applies to compression ignition internal combustion engines: 1) with a model year of 2007 or later, 2) constructed after July 11, 2005 and manufactured after April 1, 2006, or 3) modified or reconstructed after July 11, 2005. The temporary compressor that will be installed at the Dwale Station was manufactured in 1999, is not a compression ignition internal combustion engine, and will not be modified or reconstructed during the temporary operation period at the Dwale Station. Moreover, the existing compressor engines were installed at the Dwale Station in 1968. Therefore, the requirements of this subpart will not apply.

40 CFR 60 Subpart JJJJ – NSPS for Stationary Spark Ignition Internal Combustion Engines. This Subpart is applicable to manufacturers, owners, and operators of new stationary spark ignition internal combustion engines manufactured after July 1, 2007. The new temporary engine to be installed at the Dwale Station is a 1,340 Bhp 4-stroke lean burn spark ignition compressor engine. Although the engine will be installed after June 12, 2006, the manufacture date of the engine was 1999. Furthermore, the engine will not be modified or reconstructed since the original manufacture date. Therefore, this engine will not be subject to the requirements of NSPS Subpart JJJJ. Moreover, the existing compressor engines were installed at the Dwale Station in 1968. Therefore, the requirements of this subpart do not apply.

40 CFR 60, Subparts K, Ka, and Kb, NSPS for Storage Vessels for Petroleum Liquids/Volatile Organic Liquids. These subparts apply to storage tanks of certain sizes constructed, reconstructed, or modified during various time periods. Subpart K applies to storage tanks constructed, reconstructed, or modified prior to 1978 and Subpart Ka to those constructed, reconstructed, or modified prior to 1984.

The temporary storage tank at the Dwale Station will be constructed after these dates; therefore, the requirements of Subparts K and Ka will not apply. Subpart Kb applies to volatile organic liquid (VOL) storage tanks constructed, reconstructed, or modified after July 23, 1984 with a capacity equal to or greater than 75 m³ (~19,813 gallons). This storage tank will also not have a capacity greater than 75 m³. Therefore, Subpart Kb will not apply to the temporary storage tank. Since all existing storage tanks were constructed before July 23, 1984, Subpart Kb will not apply to the existing storage tanks. Subparts K and Ka will not apply to the existing tanks because each tank has capacity less than 40,000 gallons (applicability threshold for both Subparts K and Ka).

401 KAR 59:050, New Storage Vessels for Petroleum Liquids. 401 KAR 59:050 applies to the following: 1) Petroleum liquid storage tank with capacity less than 40,000 gallons and commenced on or after April 9, 1972 and prior to July 24, 1984; or 2) Petroleum liquid storage tank with capacity less than 10,567 gallons and greater than 580 gallons commenced on or after July 24, 1984, which is located in a nonattainment county for ozone or in any other county and is part of major source of VOC. The temporary storage tank will not store petroleum liquid and the Dwale Station is a minor source for VOC. Therefore, 401 KAR 59:050 will not apply to the petroleum liquid storage tanks at this station.

401 KAR 61:050, Existing Storage Vessels for Petroleum Liquids. 401 KAR 61:050 applies to each existing storage vessel for petroleum liquids which has a storage capacity of greater than 2,195 liters (580 gallons), constructed before April 9, 1972, and which is located in a nonattainment county for ozone. Since Floyd County is attainment for all criteria pollutants, 401 KAR 61:050 will not apply to the existing petroleum liquid storage tanks at this station.

401 KAR 51:150, NO_x Requirements for Stationary Internal Combustion Engines. No engine at the Dwale Station is identified as a large NO_x SIP call engine in the NO_x SIP call engine inventory prepared by the Division. This determination was made based NO_x emissions calculated to be less than 1 tpd during the average ozone season (May through September) in 1997.

EMISSION AND OPERATING CAPS DESCRIPTION:

The permittee shall comply with source-wide annual individual HAP emission and combined HAPs emissions limitations of 9.0 tons and 22.5 tons per rolling 12-month period.

In order to preclude the applicability of 401 KAR 51:017, for a significant emissions increase, the emission of volatile organic compounds (VOC) and nitrogen oxides (NO_x) from the temporary compressor (emission unit U05), dehydration unit (emission unit U06) and the reboiler (emission unit U07) shall be less than 40 tons per rolling 12-month period. Compliance will be demonstrated by limiting operation of the temporary units to no more than 945 hours per year.

PERIODIC MONITORING:

Emission testing protocol, test data and results determining PM, VOC and HAP emissions identified in the application are to be maintained on site for the life of the source. These tests shall be evaluated every five years for applicability and accuracy.

The actual average benzene emissions from the dehydration units will be monitored and be maintained less than 0.9 megagrams per year. A weekly log of the visible emissions check along with any record of Method 9 testing performed for the flare shall be maintained. Records of this data, with all deviations from permit requirements clearly identified, will be submitted to the Division semiannually. The maximum velocity and maximum net heating value of the gas being combusted in the flare shall be determined annually and testing started within 180 days of issuance of the final permit V-08-015.

Monthly reports generated from the above logs may be used to demonstrate compliance with the annual emissions. Monthly summary reports and logs shall be submitted to the Division semiannually to demonstrate compliance and upon request.

With regards to the temporary units, the permittee shall monitor the actual operating hours on a weekly basis and monitor the average natural gas flowrate to the temporary dehydration unit on a daily basis. Actual benzene emissions from the temporary dehydration unit shall be determined using model GRI-GLY Calc Version 3.0 or higher. Also, within two weeks of removal of the temporary units from service, the permittee shall submit a notification to the Division's Frankfort and regional offices providing the date the temporary units were removed and records of total operating hours of the temporary units.

OPERATIONAL FLEXIBILITY:

None

Credible Evidence:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.